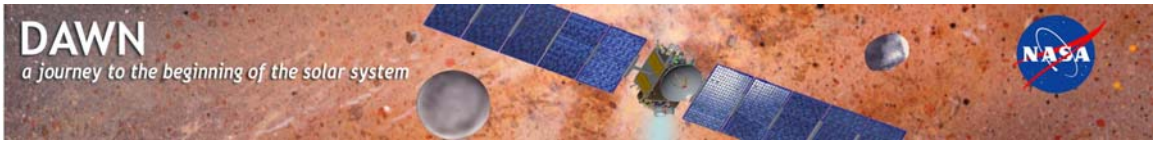


Find A Meteorite

How Do You Identify A Meteorite?

ACTIVITY

In this activity you will get to look at actual samples similar to those that people have sent in to the University as meteorites. You will decide if these samples are meteorites by using the folloiwng checklist:

1. Metal – Most meteorites contain at least some metal.

   Do you see the metal shining on a broken surface?

   θ Yes, you might have a meteorite

   θ No

   Observation Notes:

2. Density – Those meteorites that do have a lot of metal tend to be very dense.

   Do you have something very dense such that it could be a meteorite (but remember that not all meteorites are dense)?

   θ Yes, you might have a meteorite

   θ No

   Observation Notes:

3. Magnetic properties – A lot of meteorites contain shiny iron-nickel metal grains, or consist largely of iron-nickel metal. Most of the time, that metal has iron in it and iron attracts a magnet.

   Does a magnet stick on the surface of your sample?

   θ Yes, you might have a meteorite. But remember that a lot of normal rocks on the Earth are also magnetic, so just because something is magnetic doesn't mean that it is a meteorite!

   θ No

   Observation Notes:

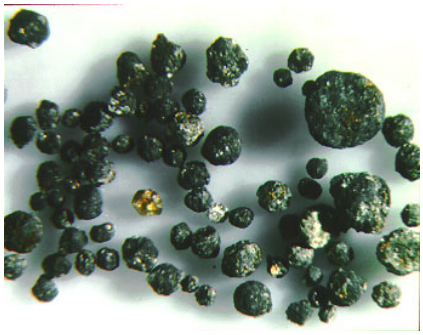
4. Chondrules – Some primitive meteorites have little round pieces of stoney material in them. These little round pieces are called chondrules. Some sedimentary and volcanic rocks can have spherical particles that look somewhat like chondrules.

   Does your sample contain chondrules?

   θ Yes, you might have a meteorite.

   θ No

   Observation Notes:



Chondrules are the primitive building blocks of the solar system. In the early solar nebula they came together to form larger and larger masses - the forerunners of asteroids and planets. The largest chondrule in this picture is less than 1 cm across. Most chondrules are so small that it is difficult to learn much about them without a microscope. *(Photo by Allan Treiman, NASA JSC photo S93-33279)*

5. Fusion crust – When a meteorite is falling through the atmosphere, it begins to heat up because of the extreme compression of the atmosphere. The meteor gets so hot that the outer surface begins to melt, which produces a thin black/brown coating on the surface of the rock. Iron meteorites may show evidence of melted metal on their surface, but this is less common. Fusion crusts are present on freshly fallen meteorites, but the crusts are fragile and can weather away from samples that fell a long time ago. Small patches of fusion crust can sometimes remain in hollows in the sample.

Stony meteorites are commonly made of familiar minerals like plagioclase, pyroxene, and olivine. Scientists believe that they were formed in the outer parts of asteroids. Stony meteorites look a lot like Earth rocks, and are often not recognized as meteorites. Their outer surfaces are usually melted as they pass through our atmosphere, giving them dark "fusion crusts." That is why the outside of the Noblesville meteorite looked so dark. *(Photo by Cecilia Satterwhite, NASA JSC photo S94-44343)*

Does your sample have a fusion crust?

θ Yes, you have a meteorite.

θ No

Observation Notes:

6. Regmaglypt texture / thumbprints – When the surface of the meteorite begins to melt during entry into the atmosphere, some areas of the meteorites are eroded by the melting more than others, almost like someone is taking little scoops of material out. This leaves a bunch of small dents in the surface of the rock, making it look like someone put thumbprints into clay. The surface of most meteorite samples have these thumbprints called "regmaglypts", which can vary in size from less than a centimeter up to as much as 10 centimeters.

   Does your sample have Regmaglypt texture/thumbprints?

   θ Yes, you have a meteorite.

   θ No

   Observation Notes:

This is one fragment of the Sikhote-Alin meteorite. It is about 15 cm across. The photograph shows the original meteorite surface, melted into thumb-print shapes during its flight through our atmosphere. *(Photo by Carl Allen, NASA JSC photo S94-43472)*

7. Streak – Most meteorites won't leave a streak, but the surfaces of some meteorites might leave a reddish streak if they have been oxidized (rusted). If your drag your sample across this "streak plate" and it leaves a red/orange line, then the sample is probably a common mineral on the earth called hematite. If the sample is magnetic and leaves a black or gray streak then it might be the common terrestrial iron-oxide mineral called magnetite.

   Does your sample cause a streak on a "streak plate?"

   θ Yes

   θ No, You may have a meteorite.

   Observation Notes:

The red-brown streak of the mineral hematite.